IntelliDrive
Commercial Vehicle V2V Safety Program

IntelliDrive Safety Workshop
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IntelliDrive for Commercial Vehicles

Vehicle to Vehicle (V2V)

- Forward Collision Warning
- Blind spot Detection
- Emergency Brake Light
- Lane Change Warning
- Do Not Pass Warning
- Other Safety Applications

Vehicle to Infrastructure (V2I)

- Intersection Safety
- Run-off Road Prevention
- Smart Roadside
  - USDOT Truck Parking Programs
    - SmartPark
  - Automated Enforcement
    - Wireless Roadside Inspections
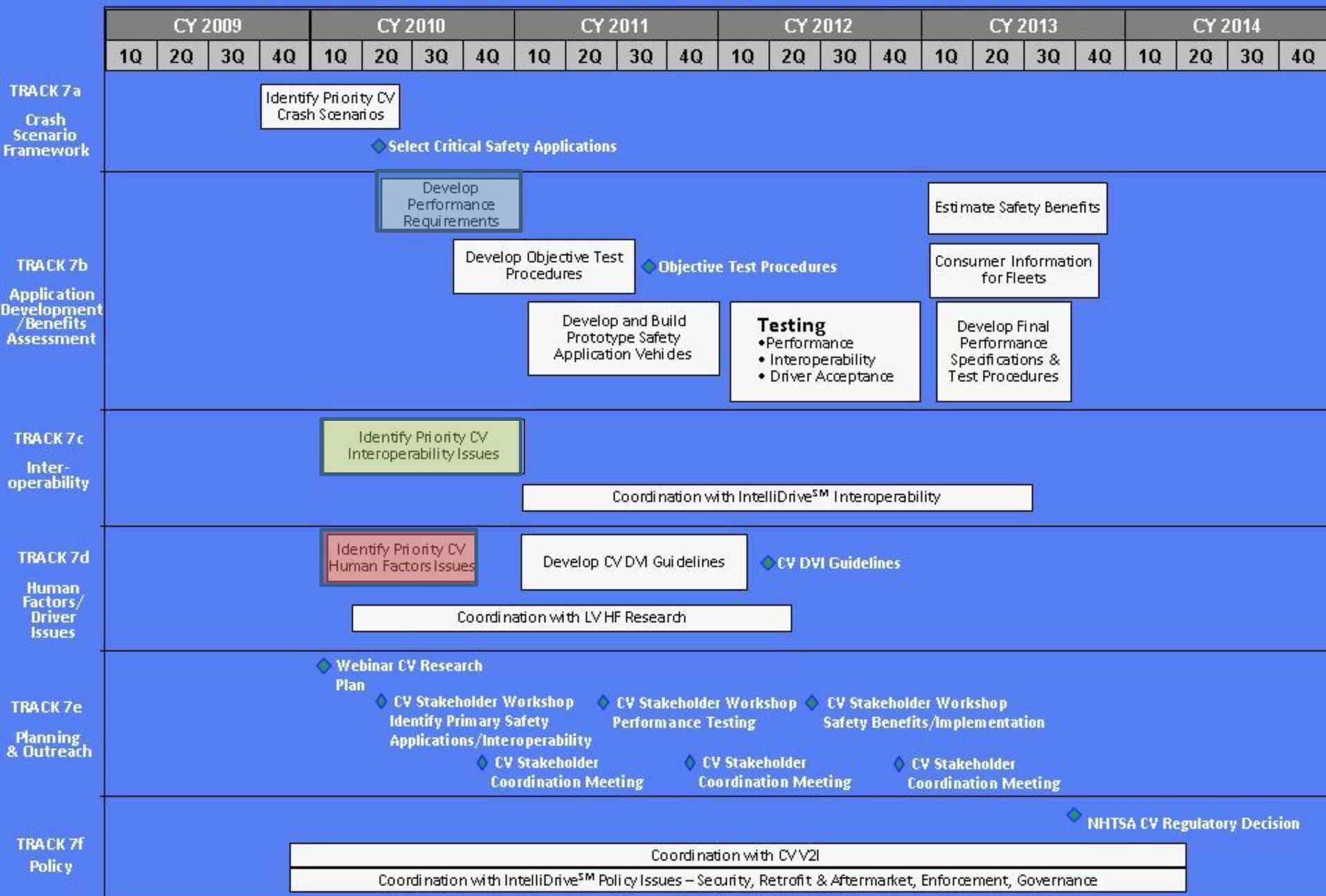- Other Safety Applications

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Track 7 – Commercial Vehicles

Objective - Resolve the technical and policy issues impeding the accelerated deployment of V2V systems for commercial vehicles.

Key Tasks

- Identify priority CV crash scenarios.
- Select priority safety applications and determine performance requirements.
- Identify CV specific interoperability issues.
- Identify CV specific human factors / DVI issues.
- Build prototype vehicles and develop objective test procedures
- Vehicle testing for performance and DVI driver acceptance.
- Estimate safety benefits for CV applications.
- Identify CV policy issues and coordinate with overall program
- Support NHTSA regulatory decisions

Commercial Vehicle V2V Safety Application Research Plan

	CY 2009				CY 2010				CY 2011				CY 2012				CY 2013				CY 2014			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q

TRACK 7a

Crash Scenario Framework

Identify Priority CV Crash Scenarios

◆ Select Critical Safety Applications

TRACK 7b

Application Development /Benefits Assessment

Develop Performance Requirements

Develop Objective Test Procedures

◆ Objective Test Procedures

Estimate Safety Benefits

Consumer Information for Fleets

Develop and Build Prototype Safety Application Vehicles

Testing
- Performance
- Interoperability
- Driver Acceptance

Develop Final Performance Specifications & Test Procedures

TRACK 7c

Inter-operability

Identify Priority CV Interoperability Issues

Coordination with IntelliDrive^SM Interoperability

TRACK 7d

Human Factors/ Driver Issues

Identify Priority CV Human Factors Issues

Develop CV DVI Guidelines

◆ CV DVI Guidelines

Coordination with LV HF Research

TRACK 7e

Planning & Outreach

◆ Webinar CV Research Plan

◆ CV Stakeholder Workshop Identify Primary Safety Applications/Interoperability

◆ CV Stakeholder Workshop Performance Testing

◆ CV Stakeholder Workshop Safety Benefits/Implementation

◆ CV Stakeholder Coordination Meeting

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◆ CV Stakeholder Coordination Meeting

TRACK 7f

Policy

◆ NHTSA CV Regulatory Decision

Coordination with CV V2I

Coordination with IntelliDrive^SM Policy Issues – Security, Retrofit & Aftermarket, Enforcement, Governance

2010 Commercial Vehicle V2V Research

University of Michigan Transportation Research Institute

Interoperability Issues

Answer the Fundamental Questions for Deployment

Performance Requirements For Applications

Virginia Tech Transportation Institute

Driver-Vehicle Interface (DVI) Needs

Battelle Center for Human Performance and Safety

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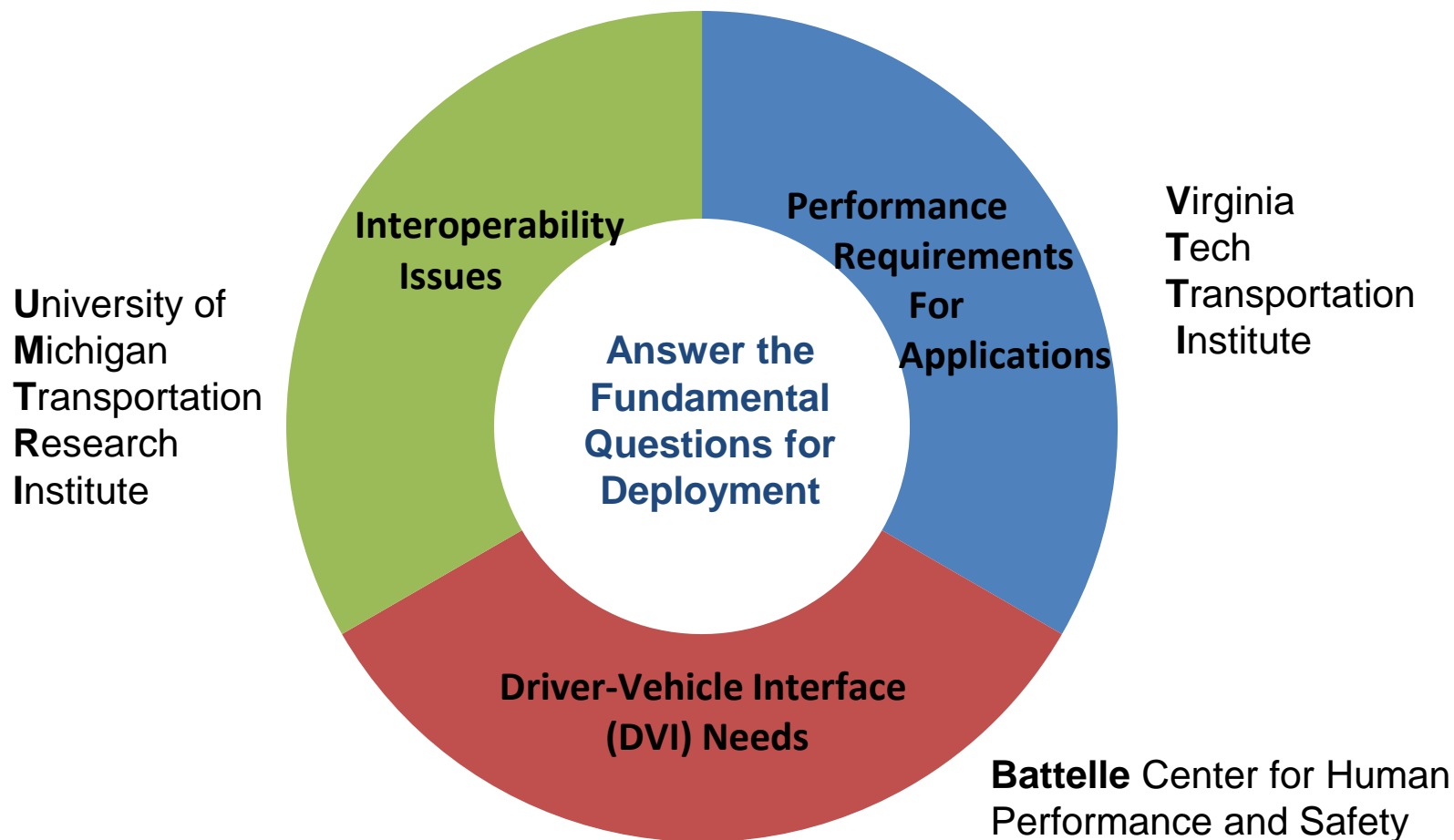
CV Interoperability Issues

- Consider root causes and platform context to identify CV interoperability issues
    - Root cause - antenna placement limitations, multipath, density of vehicles, CAN bus performance, others?
    - Platform context - anticipated application requirement, vehicle factors, usage factors, operational patterns.
- CV Issues of concern to LV
- Issues considered by LV, but not of priority concern, where root causes or platform context differs in significant ways
    - e.g., Trailer configurations
- Issues arising from unique CV context
    - e.g., Effect of commercial vehicle's limited & load-dependent maneuvering levels

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Performance Requirements

Minimum Performance
What is needed to ensure proper system function?

Sensors
Warning
Reliability

Functional Requirements

Lead Vehicle:
Position
Speed
Engine Brake

Trailing Vehicle:
Position
Speed
Range
Closing Distance

Crash Type: Rear End Collisions

Emergency Brake Light*

*Example application

Driver Vehicle Interface (DVI) Specifications

- Develop DVI guidelines to address:
  - Message presentation characteristics
    - Auditory, visual, and haptic displays
  - Integration and prioritization of messages
    - Message conflicts
    - Arbitration of concurrent warnings
    - Nuisance / false warning mitigation
  - Driver overload and distraction
    - Minimize errors, workload, and confusion
    - Minimize eyes-off-road time
    - Specific strategies to identify and address distraction in real-time

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CV Research Timeline

- Project kickoff meetings were held June 2010.
- Project durations are 7-8 months each.
- Final reports submitted at the end of 2010.
- Looking ahead to 2011:
  - CV Test Vehicle Builds
  - Safety Pilot
  - Driver Clinics
  - Model Deployment

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